

U. S. AIR FORCE
SPECIFICATION
BULLETIN

NO. 505
18 June 1959

PARACHUTES, PERSONNEL, TESTING
STANDARDS FOR

1. SCOPE AND PURPOSE

1.1 This bulletin applies when called out in a specification or other Air Force document. It establishes testing standards for the development testing of experimental man-carrying parachute assemblies and components thereof and outlines the general types of personnel parachutes and specific test procedures.

2. REQUIREMENTS

2.1 DATA AND MATERIALS. The following data, drawings, instructions and materials in support of the testing standards shall be submitted in duplicate to the cognizant research and development activity designated by the procuring activity for review and approval.

- a. Schematic or outline drawings of the parachute assembly.
- b. Data covering average permeability of each canopy.
- c. Written description of the sequence of operation of the primary parachute system to include performance and schematics.
- d. Written description of the sequence of operation of the reserve or auxiliary parachute system to include performance and schematics when integral with a premeditated jump-type parachute or emergency-type parachute.
- e. Drawings and specifications descriptive of the components to include type, size, construction, materials, et cetera.
- f. Detailed specifications of actuating, sensing, and release devices, drogue guns, disconnects, et cetera.
- g. Detailed test program and procedures for component and parachute assembly testing to include government facilities and equipment required.

FSC 1670

USAF and Navy
review(s) completed.

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2.2 TYPICAL PARACHUTE RECOVERY SYSTEMS. Parachute recovery systems shall be within the limits of human tolerance as defined in MIL-C-25969 and categorized as follows:

a. Emergency-Type Parachute - Parachutes of this type shall be fully or semi-automatic for utilization with ejection-seat-equipped aircraft, or non-automatic or semi-automatic for other emergency escape applications.

b. Premeditated-Jump-Type Parachutes - Parachutes in this category shall normally be static line, timer, or otherwise automatically activated for the express purpose of aerial delivering combat, rescue, intelligence, or special purpose personnel. All premeditated-jump-type parachutes shall include a reserve or auxiliary parachute for emergency utilization. The secondary parachute shall be manually operated.

2.3 TESTING STANDARDS. The following test procedures establish the minimum acceptable standards for testing personnel parachute assemblies and components thereof. Parachute assemblies or components which have been proven under conditions similar to those prescribed herein shall be acceptable.

2.3.1 PARACHUTE ASSEMBLY TESTING

2.3.1.1 RATE OF DESCENT TESTING. Five parachutes shall be utilized to complete a series of 10 tests. The permeability of each canopy shall be checked prior to test. A rubber dummy (torso or bent form) weighting 200 pounds shall be dropped at 120 knots indicated airspeed and at an altitude that will permit parachute inflation at approximately 1,000 feet above the terrain. Static line or timer actuation is acceptable. Phototheodolite recordings of descent rate are desirable; however, if phototheodolite is not available, the drop line method of determination outlined in 2.3.1.1.1 and 2.3.1.1.2 may be substituted.

2.3.1.1.1 DROP LINE RIGGING. A 300-foot length of nylon suspension line, measured under 20 pounds tension and conforming to Type III of MIL-C-5040, shall be attached to, and neatly wound around, a lead ball approximately 3 inches in diameter; a length of white sheeting approximately 3 by 18 inches shall be attached to the ball for identification purposes. The rolled drop line shall then be placed in a sack-type container of suitable size and secured therein with a standard temporary locking pin which passes through a bungee-type loop to lock the cover. The container shall be attached to the dummy with the cover end of the container positioned towards the feet. A short length of nylon cord in accordance with

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Type III of MIL-C-5040 shall be attached to the temporary locking pin and a parachute connector link. The slack in this line shall be kept to a minimum. The end of the rolled drop line shall be securely tied to a parachute leg strap or saddle. Upon parachute opening, the extending riser shall withdraw the locking pin and permit the weighted line to hang beneath the dummy.

2.3.1.1.2 DROP LINE RECORDING. The rate of descent for each test shall be recorded by a minimum of two observers. Each observer shall be equipped with an accurate stopwatch and shall record impact intervals between the lead ball and the dummy. Observed descent times shall be averaged and the average converted to feet per second. Line length lost through knots or entanglement shall be measured and deducted from the original 300 feet prior to feet-per-second conversion. Descent rates shall be corrected to standard NASA atmosphere at sea level and averaged.

2.3.1.1.3. ADDITIONAL RATE OF DESCENT TESTING. In addition to the tests specified in 2.3.1.1, premeditated jump-type parachutes shall be subjected to rate of descent tests with dummies weighing 250, 300, and 350 pounds. Five tests at each weight are required.

2.3.1.2 TWISTED LINE TESTING. Four parachutes shall be tested. Ten tests on each parachute are required. Each parachute to be tested shall be rigged to a 250 pound rubber dummy and launched with a 15 foot static line from an altitude of 500 feet above the terrain at an indicated airspeed of 110 knots, or the safe minimum airspeed greater than 110 knots of the most suitable aircraft available. The launching method shall insure minimum dummy rotation. Each parachute tested shall be prepared for test in accordance with 2.3.1.2.1 and 2.3.1.2.2.

2.3.1.2.1 PREPARATION FOR TWISTED-LINE TESTING. Each parachute shall be subjected to permeability determination prior to testing. Permeability measurements shall conform to the specification governing the canopy material. Parachute canopies constructed of materials having an average permeability in the lower half of the specification permeability range may constitute not more than one-half of the test quantity.

2.3.1.2.2 PACKING PROCEDURE FOR TWISTED-LINE TESTING. The parachute canopy shall be folded in the prescribed or proposed manner. For parachutes utilizing deployment bags or other deployment aids, the stows of lines which close or lock the deployment bag or the lines which emerge from a closed deployment bag shall be inserted in the manner proposed for standard usage. Three 360-degree twists in either direction shall then be placed in the

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suspension lines immediately below the point at which the bag is locked closed, or the point at which the lines emerge from the bag when locked closed by other than the suspension lines. The three twists shall extend from the locking or emergence point a maximum of 30 inches. The twisted and non-twisted portions of suspension line shall then be stowed in the manner proposed, particular care being exercised to prevent the twisted portion of the lines from exceeding the 30-inch maximum length. If due to increased girth, difficulty is encountered in stowage of the twisted portion, the line retaining member, for test purposes, may be modified to obtain the desired retention characteristics. For parachutes that do not utilize a deployment bag the three 360-degree twists shall be placed immediately below the canopy shirt for a length not in excess of 30 inches and the lines stowed as proposed for standardization.

2.3.1.2.3 TWISTED LINE TEST CRITERIA. All test parachutes shall be fully inflated and in equilibrium prior to ground impact. Forty consecutive tests, without failure, are required.

2.3.1.3 RELIABILITY TESTING

2.3.1.3.1 EMERGENCY TYPE PARACHUTES. Five parachutes shall be utilized for a total of 25 tests. The permeability of each canopy shall be inspected prior to testing. Each parachute shall be rigged to an articulated dummy weighing 250 pounds and all tests shall be conducted from an altitude of 1,500 feet above the terrain. Parachute actuation shall occur 5 seconds after launching. Five tests are required at an indicated airspeed of 110 knots and five tests at 150 knots. The remaining tests shall be conducted by increasing the launching speed in 50-knot increments for each group of five tests, until testing has been completed at 300 knots.

2.3.1.3.2 PREMEDITATED-JUMP-TYPE PARACHUTES. Five parachutes, the canopies of which have been subjected to permeability inspection shall be utilized for a total of 20 tests. Each parachute shall be rigged to a 250-pound articulated dummy and launched from an altitude of 1,000 feet above the terrain. The parachutes shall be activated via the static line or other method proposed for standardization. Four tests shall be made at an indicated airspeed of 110 knots, four tests at an indicated airspeed of 150 knots, and the remaining tests in groups of four at increased airspeed increments of 50 knots.

2.3.1.4 LOW-ALTITUDE TESTING. The permeability of each canopy shall be inspected prior to testing. The use of a phototheodolite is recommended for determination of the minimum altitude required for complete parachute inflation in the launching speed ranges specified in 2.3.1.4.1.1, however, calculations recorded in conjunction with

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the testing specified in 2.3.1.1, 2.3.1.2, and 2.3.1.3 may be utilized if phototheodolite coverage is not available. In the absence of reliable data, testing shall start at 500 feet and be adjusted to the minimum altitude required for safe recovery under the required airspeed conditions. The minimum safe altitude is considered to be the highest altitude required for full parachute inflation of all test parachutes throughout the test range.

2.3.1.4.1 LOW-ALTITUDE TEST TECHNIQUES

2.3.1.4.1.1 Four parachutes rigged to 250-pound rubber dummies shall be launched for a total of eight tests at a near zero airspeed and at the minimum calculated altitude required for complete canopy inflation. Parachute activation shall be through the medium of a 15-foot static line unless, for standardization, a line of another length is proposed. On the basis of test findings, a minimum reliable altitude shall be established for use with liaison, rotary wing, and other low performance aircraft.

2.3.1.4.1.2 Four parachutes shall be rigged to 250-pound rubber dummies and dropped at an airspeed of 200 knots at the altitude determined by tests specified in 2.3.1.4.1.1. The tests shall be repeated for speeds of 150 and 110 knots. The altitude shall be adjusted to the minimum compatible with reliable parachute opening at each airspeed. Three consecutive successful tests shall then be made at each adjusted reliable minimum altitude. Three consecutive successful drops at the same altitude and airspeed during the altitude adjustment phase are acceptable.

2.3.1.5 ULTIMATE STRENGTH AND OPENING FORCE TESTING. Five new parachutes are required for a minimum of 30 tests. Each parachute shall be rigged to a 350-pound dummy and dropped at an altitude of 1,000 feet. A static line of proposed design length or timer controlled, one second delay, shall be used for parachute activation. A tensiometer shall be utilized to record opening forces. Parachutes destroyed at the lower airspeeds shall be replaced with new parachutes. A whirl tower may be utilized in lieu of aircraft, provided whirl-tower versus aircraft-conversion curves are provided for each test.

2.3.1.5.1 ULTIMATE STRENGTH TEST PROCEDURE. Parachutes shall be rigged to 350-pound dummies. Five tests shall be made at 110 knots and five tests at 150 knots. The remaining tests shall be conducted in groups of five at airspeed increases of 50 knots per group until tests have been completed at 400 knots or until parachute destruction occurs. Additional tests, as required, shall be conducted to establish destruction speed within 25 knots.

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2.3.1.6 AIRBLAST TESTING. This test phase applies to emergency-type parachutes and premeditated-jump-type parachutes designed for utilization with high-speed aircraft. Four test parachutes are required for a total of 10 tests. Each test parachute shall be rigged to a 250-pound articulated dummy. All tests shall be conducted from 2,000 feet or the minimum altitude required for safety of flight. Parachute activation shall be as determined by the testing activity, but shall be not less than 5 seconds after launching. Four tests shall be conducted at 300 knots. Two tests shall be conducted at increasing airspeed increments of 100 knots until an indicated airspeed of 600 knots has been attained. Final pack destruction speed shall be determined within 50 knots.

2.3.2 COMPONENTS TESTING. Parachute assembly components such as sensing devices, release mechanisms, disconnects, drogue guns, et cetera, shall be tested with the related parachute assembly. Parachute assembly and component testing shall include:

- a. Ground (bench) tests
 - (1) Life cycling
 - (2) Harness styling and comfort
 - (3) Hardware function
 - (4) Ultimate strengths
 - (5) Maintenance analysis
- b. Environmental tests
 - (1) Acceleration
 - (2) Vibration
 - (3) Shock
 - (4) High temperature
 - (5) Low temperature
 - (6) Sand and dust

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- (7) Humidity
- (8) Salt spray
- (9) Aneriod pressure
- (10) Fungus

2.3.3 LIVE JUMP TESTING. Parachute assemblies or components thereof that do not meet the established test standard, or are marginal in reliability, shall not be subjected to live-jump testing until proven to be safe beyond reasonable doubt. Parachute assemblies or components that have been modified to affect performance shall be subjected to complete or partial retest prior to live jump when considered necessary by the testing activity. The number of assemblies or components required and tests to be performed shall be determined on the basis of the successful completion and acceptance of tests conducted under 2.3.1 and 2.3.2.

2.3.3.1 MINIMUM AND MAXIMUM AIRSPEED TESTING. The results of tests conducted under 2.3.1.3, 2.3.1.4, and 2.3.1.5 shall be evaluated to determine the airspeed range acceptable from the parachute reliability and human tolerance aspect. Tests shall be initiated at the established minimum airspeed and continued at increased increments of 25 knots for emergency-type parachutes and 10 knots for premeditated-jump-type parachutes until tests have been completed at the established maximum. Ten tests per speed increment are required. Minimum altitude shall be as determined by the testing activity; it shall be constant throughout the test phase and shall, under no condition, be below 1,500 feet above the terrain. Premeditated-jump-type parachutes shall be activated by the method proposed for standardization. Emergency-type parachutes shall be activated by the jump and pull method. In each test the automatic release shall be armed prior to aircraft exit. Unless otherwise specified, the airspeeds specified in this bulletin are indicated airspeeds in knots.

2.3.3.2 OPTIMUM EXIT TECHNIQUE TESTING. Test criteria shall be as specified in 2.3.3.1 and may be concurrent with 2.3.3.1. Optimum exit techniques shall be determined at the minimum, median, and maximum airspeeds. Ten tests are required at each established airspeed. This test phase applies only to premeditated-jump-type parachutes.

2.3.3.3 GENERAL EVALUATION TESTING. Three hundred tests are required. Altitude and airspeed requirements shall be as determined by the testing activity and shall encompass the entire

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range of safe and reliable operation established by previous tests. Tests shall be equitably distributed to provide adequate data relative to parachute assembly and component functions under closely simulated operational conditions. Testing shall determine recommended techniques of use, depth of training required, replacement requirements, and human subject reaction.

2.3.4 SPECIAL PURPOSE TESTING. Parachute assemblies or components designed for special-purpose application shall be subjected to the tests specified in 2.3.5. Test conditions and the quantity required shall be predicated on the design characteristics of the parachute proposed for standardization and, in the absence of a detail specification, shall be as determined by the testing activity.

2.3.5 OPTIONAL TESTING. Special-purpose parachute assemblies and components shall be subjected to the following tests as applicable:

a. Drift, inherent and induced, under varying wind and load conditions shall be determined. Phototheodolite, Askania, or equally accurate methods of test recording are required.

b. Maneuverability, when a design feature, shall be determined. Testing shall include controlled rate of turn controlled rate of descent, techniques of use, ease of operation, and the determination of other characteristics that are designed to result in deviation of the parachute from a normal flight path.

c. Stabilizing devices, staged deployment systems, timing devices, et cetera, shall be tested as proposed for standardization and in accordance with detail specifications or other test programs as applicable.

d. Aircraft ejection - Where practical and equipment availability permits, emergency parachutes shall be tested in actual dummy and live ejection tests.

e. Other tests - This bulletin is not limiting in scope of tests which may be conducted. The contractor or cognizant research and development activity may suggest, request, or require additional testing within the state-of-the-art to be included in the program.

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2.3.6 PERMEABILITY DATA. The average permeability of each canopy to be tested shall be determined from three readings obtained in each section of every fifth gore. The individual reading procedure shall be in accordance with Method 5450 of CCC-T-191 and any specific requirements of the specifications applicable to the cloth in the submitted canopies.

(Copies of documents required by contractors in connection with specific procurement functions should be obtained from the procuring activity or as directed by the contracting officer.)

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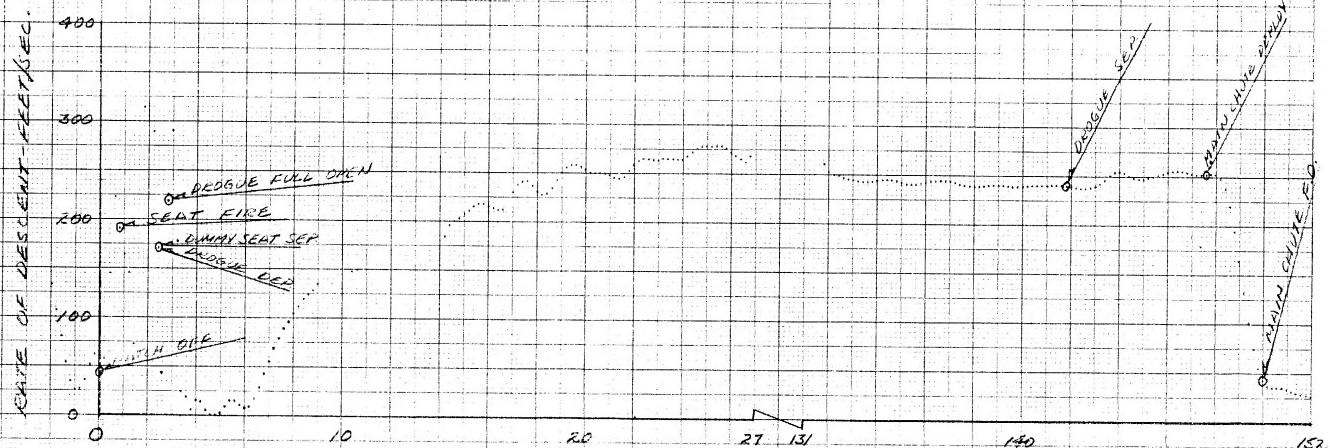
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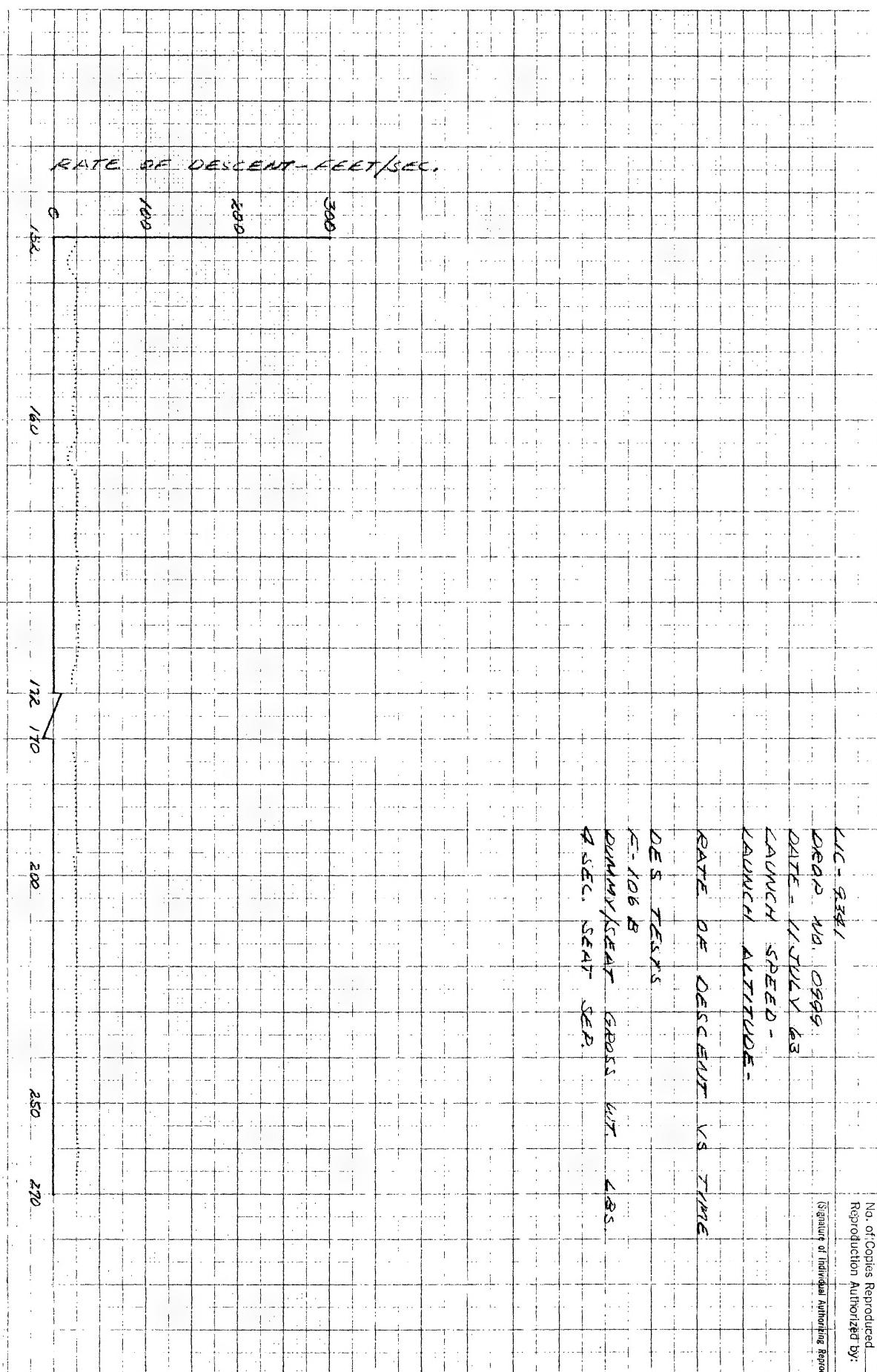
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 LAUNCH ALTITUDE -

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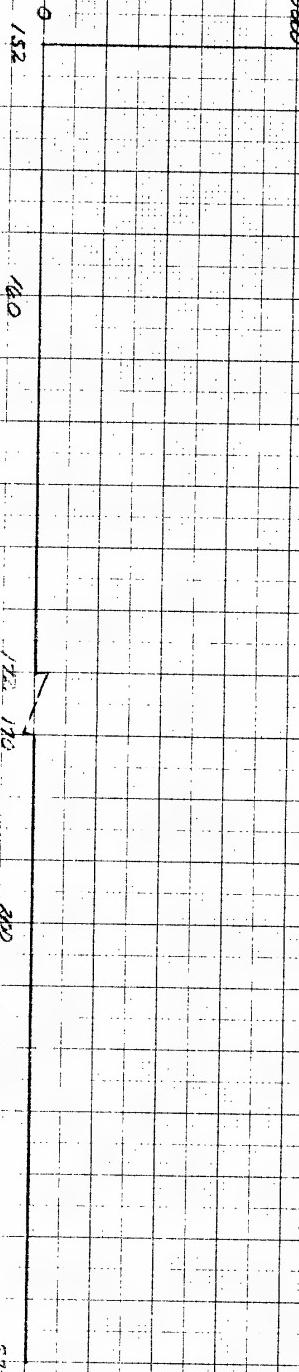
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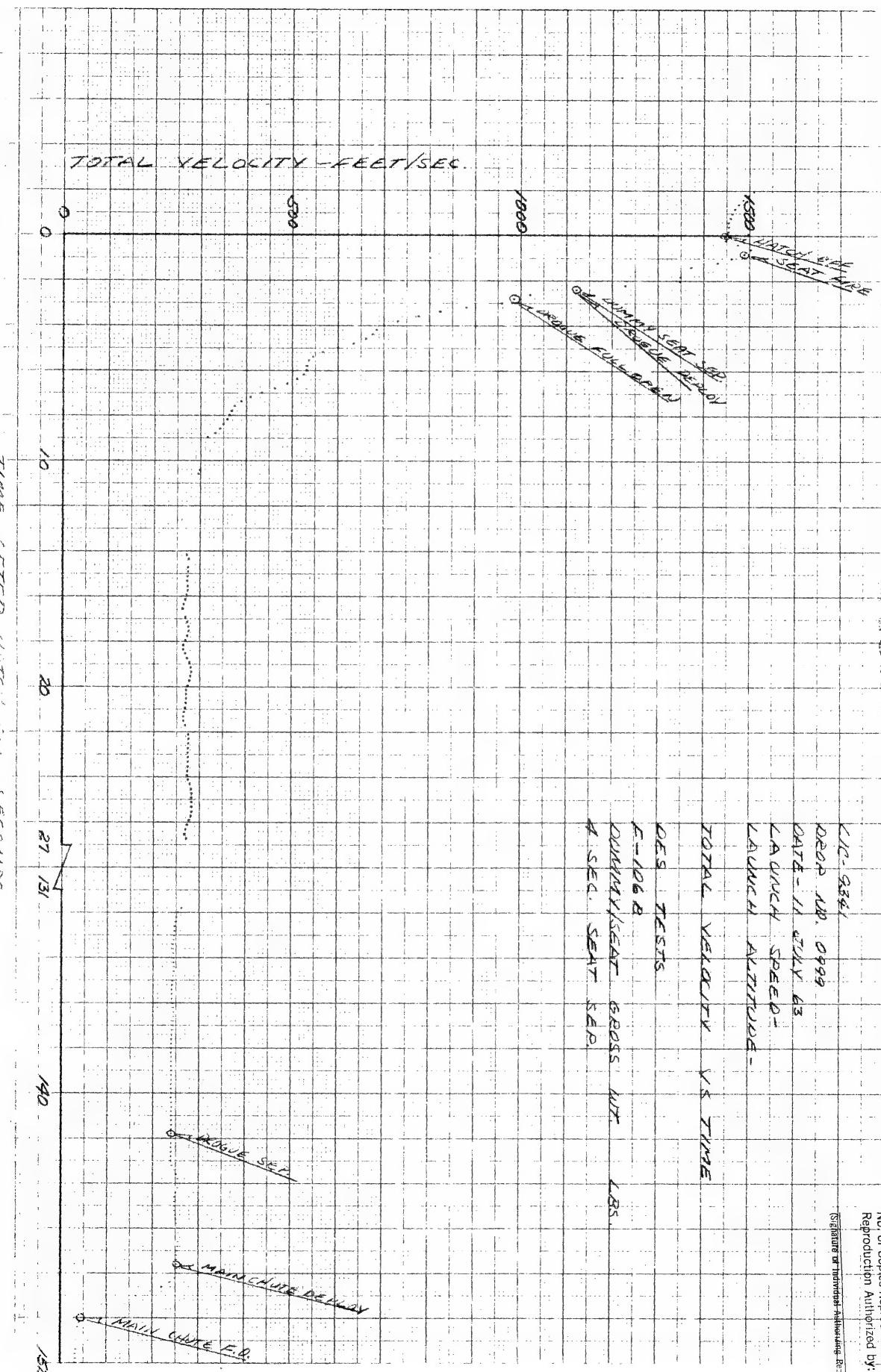
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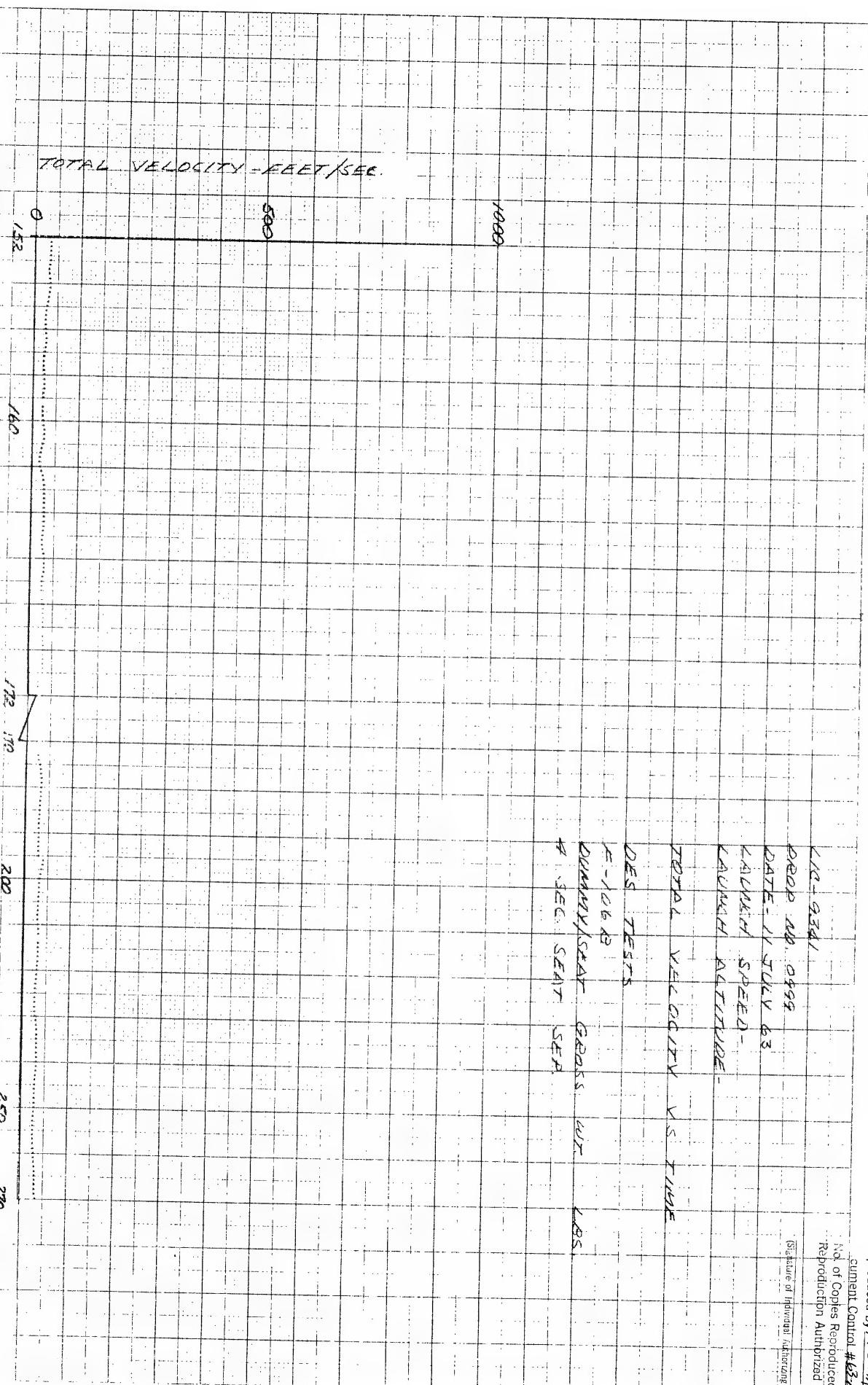
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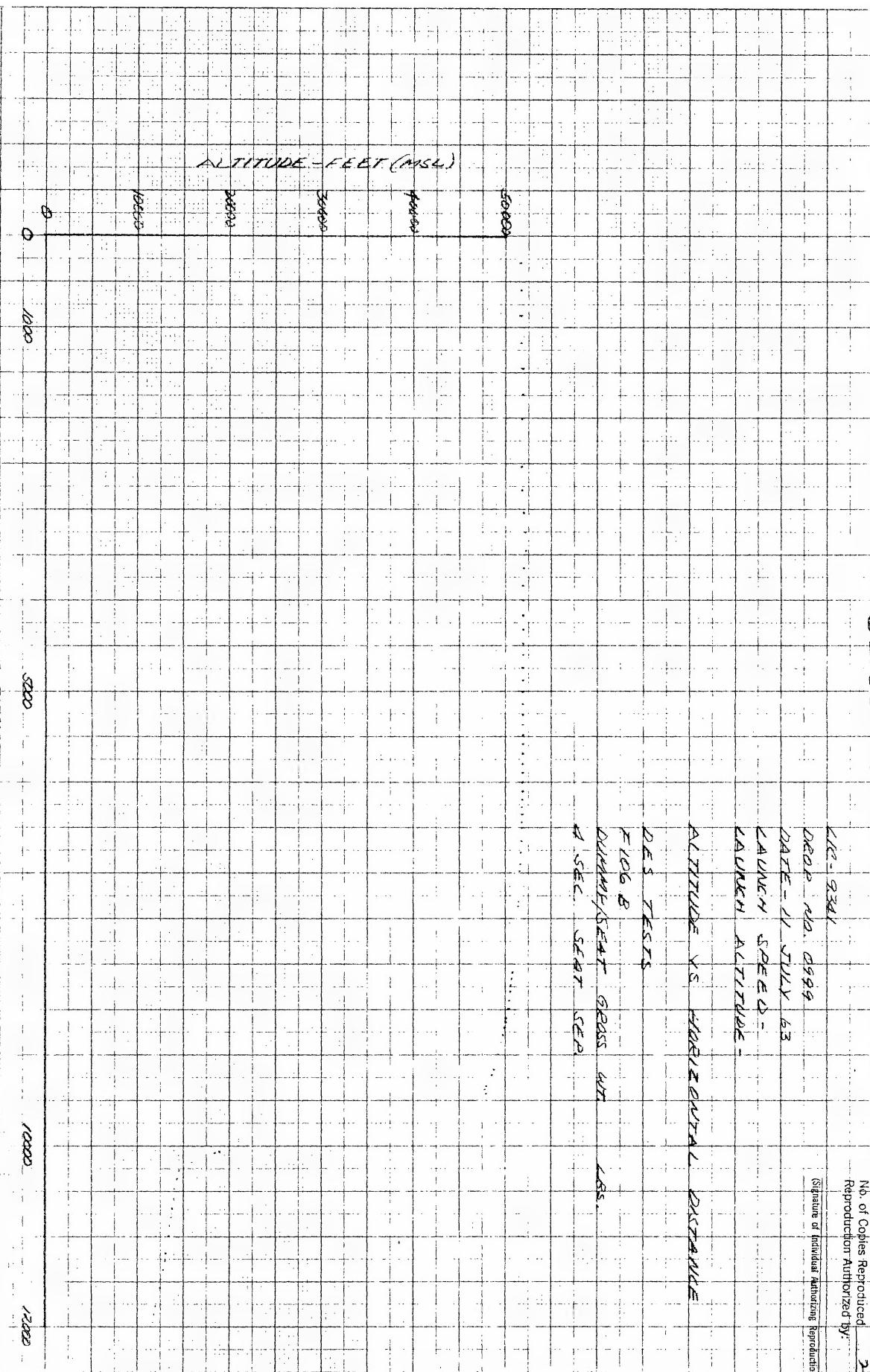
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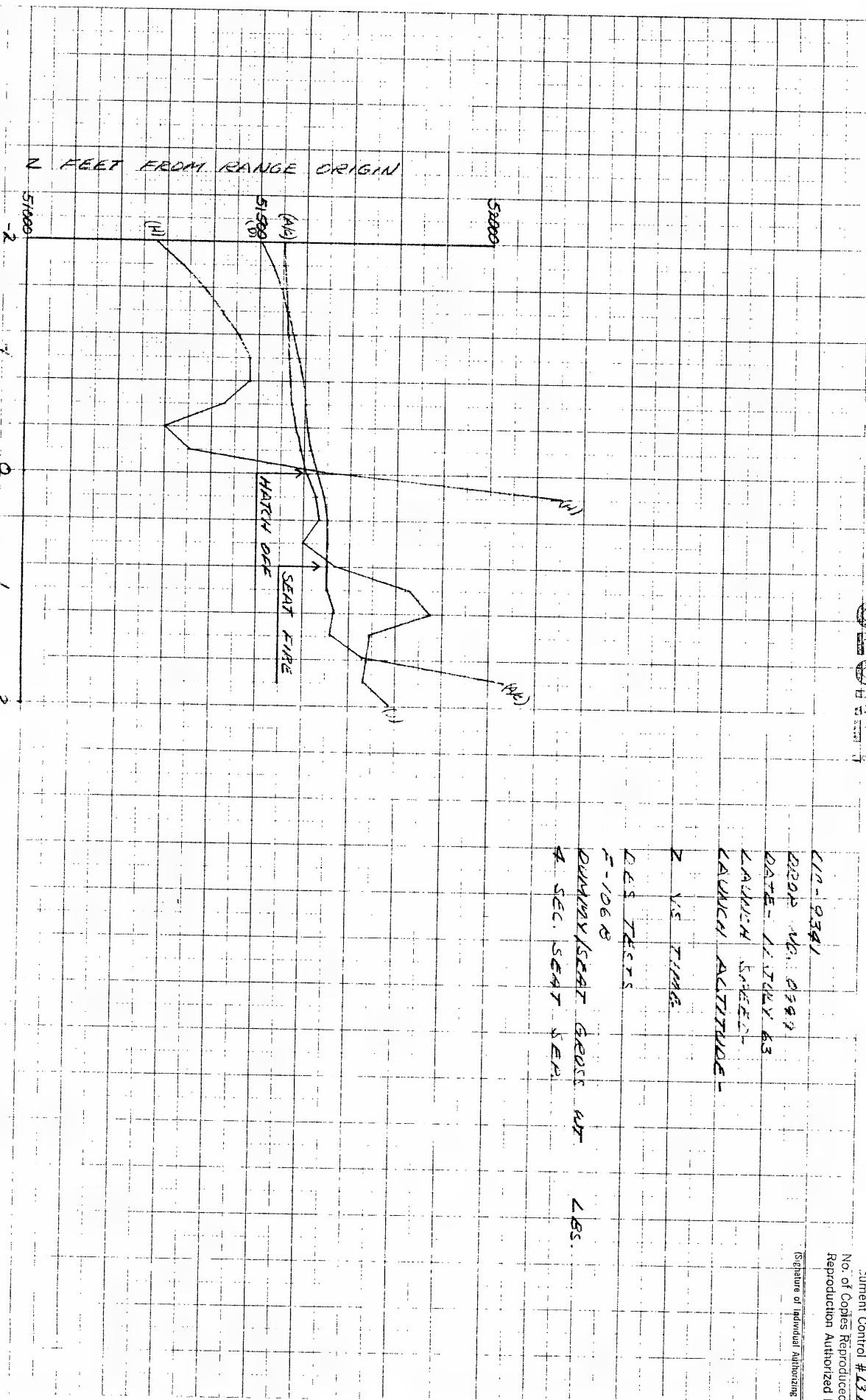
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DROP TOWER TESTS

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TEST CONDITIONS										INSTRUMENTATION DATA			RESULTS			REMARKS
TEST NUMBER	DROP NUMBER	DATE	GROSS WEIGHT	DROP HEIGHT	DROP POSITION	LOAD TRANSMITTED THRU	LEFT RISER FORCE	RIGHT RISER FORCE	TOTAL PEAK FORCE	*	*	*	*	*	*	*
1	1055	7-1-64	302	26'	Feet Down	Drogue Risers	4450	4550	7550				Left side pack-vest seam opened up approximately 4 inches from point where pan widens and on down pack (Refer to photo 15149)			Cause of pack damage attributed to too much slack in the horizontal back strap. Automatic actuators & emergency oxygen systems performed satisfactorily after test.
2	1056	7-1-64	302	25'	Back Down	Drogue risers	5400	5400	4100*				Same as above			Same as above * Probable low value due to shock absorption characteristics of webbing
3	1057	7-6-64	302	28'	Head Down	Drogue Risers	4850	3700	6700				Main canopy deployed & drogue risers released when actuators armed & fired when shocked. Cable housing bosses on drogue releases broken off.			Refer to text of report. Cause of broken bosses attributed to bending action of steel neck of dummy on housings.
													Pack stiffener fabric seams opened 3 inches both sides at pack retention straps (minor damage) side seams opened approx. 1 inch (minor damage) (refer to photos 15163, 15164, 15165).			Pan and webbing modified to remove excess slack at horizontal back strap (refer to photos 15268, 15269) No pan damage, emergency oxygen - O.K.
4	1058	7-6-64	281	25'	Feet Down	Main Risers	4450	4350	8700				O.K. - No damage			No actuators or canopies in pack. Emergency oxygen - O.K. Same modification as above & incorporated for remainder of the program.
5	1059	7-6-64	281	25'	Back Down	Main Risers	3700	3700	5800				O.K. - No damage			No actuators or canopies in pack. Emergency oxygen - O.K.
6	1060	7-6-64	285	28'	Head Down	Main Risers	3150	3800	5500				Wrap around keeper on right main lift web stitching torn out. Vest torn loose from harness, rear cross strap attachment to top of vest threads torn (refer to photos 15161, 15162)			Cause of damage attributed to down peeling of webbing to the keeper and because this was 4th maximum strength test performed on this harness. Drogue packed, no actuators installed, emergency oxygen - O.K.
																* Left & right riser forces obtained from Brinell Gauges ** Total peak forces obtained from tensiometer

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WHIRL TOWER TESTS

PAGE 1 OF 2

TEST CONDITIONS		RESULTS		REMARKS
		TIME (SEC) * FILM STOP- WATCH	TM DATA	
P75B002	TEST NO. 0020050-1			
	DROP NUMBER			
	DATE			
	GROSS WEIGHT			
	SPEED KNOTS			
	RPM			
	ALTITUDE FEET			
	TIME TO FULL OPEN MAIN			
	TIME TO IMPACT			
	PEAK LEFT RISER			
	PEAK RIGHT RISER			
	PEAK BOTH RISERS			
	CANOPY DAMAGE			
1094	7-7-64 257 90 8.4 90	3.1* 3.60 3.70	1000 450 1300 NONE	- - Good deployment & recovery No actuators packed Drogue packed
1095	7-7-64 251 90 8.4 90	286 - 3.70	700 700 1200 NONE	- - Questionable full opening before impact No actuators packed Drogue packed
1096	7-7-64 251 90 8.4 90	354 3.0* 3.50 3.60	- - - NONE	- - TM instrumentation failed No actuators packed Drogue packed
1097	7-8-64 257 90 8.4 90	306 1.8* 3.20 3.40	700 700 1400 NONE	- - Good deployment & recovery No actuators packed Drogue packed
1098	7-8-64 251 120 11.3 109	309 3.0* 3.60 4.10	1200 1200 2400 NONE	- - Good deployment & recovery No actuators packed Drogue chute out & whirling
1099	7-8-64 251 120 11.3 109	316 - 3.20 3.30	- - - NONE	- - Good deployment & recovery Actuators packed, drogue out & whirling Hesitation or drogue release caused by incomplete preparation [or drogue releases (detent screws not properly adjusted)]
1100	7-9-64 251 120 11.3 109	296 - 3.90	750 1000 1700 NONE	- - Good deployment & recovery Actuators packed Drogue out & whirling

WHIRL TOWER TESTS

TEST CONDITIONS										TIME-SEC. * FILM STOPWATCH	TM DATA	RESULTS	REMARKS			
TEST NO.	DROP NUMBER	DATE	GROSS WEIGHT	SPEED KNOTS	RPM	ALTITUDE FEET	DISTANCE TO IMPACT, FT.	TIME TO FULL OPEN MAIN	TIME TO IMPACT	PEAK LEFT RISER	PEAK RIGHT RISER	PEAK BOTH RISERS	CANOPY DAMAGE			
400020050-1	1101	7-9-64	251	120	11.3	109	311	-	2.64	-	900	500+	1400+	NONE	-	Good deployment & recovery Actuators packed
400020050-1	1102	7-9-64	257	300	28.1	123	698	-	4.04	-	3200	2900	5900	MODERATE	Pilot damaged at impact (refer to photo 15271) Breast strap pulled out of harness (refer to photo 15274) Pilot chute completely destroyed (refer to photo 15275) Quarter bag inverted (refer to photo 15270) Medium damage to vent cap. Light burns and strains main canopy, top 2 sections of gores #2 & 24 blown (Refer to photo 15274)	Good deployment & recovery Drogue out & whirling No actuators or drogue packed
400020050-1	1103	7-10-64	257	300	28.1	123	467	-	7.20	3500	3600	7100	SLIGHT	Few light burns Quarter bag damage at locking loop (refer to photo 15283) Minor tear in netting at base of pilot chute. Damaged pack fabric & wing flap seam (refer to photo 15276) Damaged drogue deploy & right drogue release housings (refer to photo 15277)	Good deployment & recovery, No actuators or drogue packed Damaged drogue deploy housing - attributed to T.M. link Damaged drogue release housing - attributed to contact with steel neck of dummy	
400020050-1	1104	7-10-64	251	300	28.1	123	459	2.0*	3.14	3000	3100	5900	SLIGHT	Light burns & seam strains 1" seam separation at top of blow out cap flap Damaged drogue depolyhousing, drogue pack flap & plate torn off (refer to photo 15279) Dropped pack fabric & wing flap seam (refer to photo 15278)	Good deployment & recovery No actuators or drogue packed Drogue deploy housing damaged at end fitting and drogue pack flap torn off - attributed to T.M. instr. link (refer to photo 15280)	
Approved For Release 2003/09/30 : CIA-RDP75B00285R000400020050-1	1105	7-14-64	275	300	28.1	123	411	2.31	6.20	#	-	-	SLIGHT	Light burns & seam strains on main canopy Separation of inner pack cover material and side flap (refer to photo 15281) Minor tear in pilot chute. Minor drogue canopy & riser leakage (refer to photo 15282)	Good deployment & recovery Drogue was packed Actuators armed for unknown reason T.M. instrumentation not used for operational testing	

HIGH Q. B-66 ARTICULATED DUMMY DROPS

TEST CONDITIONS		TIME SECONDS	RATE OF DESCENT		RPM DROGUE	DROGUE FORCES	RESULTS	REMARKS
TEST NUMBER	DROP NUMBER		DROGUE	MAIN				
1 1092	7-16-64	308	300	20,000'	21,350'	---	---	DATE
2 1140	7-20-64	308	300	20,000'	21,550'	37.1	38.2	GROSS WEIGHT
3 1093	7-21-64	308	300	20,000'	21,550'	168	155	SPEED KIAS
4 1141	7-21-64	308	300	20,000'	21,500'	169	161	PRESSURE ALTITUDE
20,000'						26	20	ACUTAL ALTITUDE
21,350'						22	17	DROGUE RELEASE
						17	11	MAIN OPEN
						18	10	IMPACT
						19.5	18	MAX.
						22.5	18	MIN.
						22.5	18	AVG.
						9.5	18	LAST 200 FT.
						50	39	MAX.
						45	1100	MIN.
						39	700	AVG.
						45	1800	LEFT RISER
						45	700	RIGHT RISER
						45	700	BOTH INSTANTANEOUS
								Complete loss - Main Deploy - Drogue release actuator failed to function Refer to photos # 15241 thru 15249
								Minor crimp in right hand drogue release housing (Refer to photo 15331) Small burns in peak of drogue canopy No pack or harness damage
								Minor crimp in right hand drogue release housing (Refer to photo 15331) Small burns in peak of drogue canopy No pack or harness damage
								Minor crimp in right hand drogue release housing (Refer to photo 15331) Small burns in peak of drogue canopy No pack or harness damage
								Launch position - same as above Successful Refer to photos 15329 & 15330
								Launch position - same as above Successful Refer to photos 15284, 15306, 15307.
								Small burns in peak of drogue canopy No pack or harness damage
								Small burns in peak of drogue canopy No pack or harness damage
								Launch position - same as above -- The date, film coverage (Askania & Contraves not available Successful

LIVE JUMPS

TEST CONDITIONS		TIME - SECONDS	RATE OF DESCENT DROGUE	RATE OF DESCENT MAIN	RESULTS	REMARKS
1	1125	7-27	Collins 315 110 6000 C-130	NA 3.0 296 NA	NA NA NA NA	20050-1 TEST NUMBER DROP NUMBER DATE SUBJECT GROSS WEIGHT SPEED KIAS ALTITUDE AIRCRAFT DROGUE RELEASE MAIN OPEN IMPACT MAX. MIN. AVG. MAX. MIN. AVG. LAST 200 FT.
2	1126	7-27	Boyle 304 110 6000 C-130	NA 2.8 297 NA	NA NA NA NA	Satisfactory main canopy performance Satisfactory kit release & landing
3	1169	7-28	Collins 315 110 20000 C-130	36.1 38.6 728 178	170 175 30 11	Main canopy performance solid. Satisfactory kit release & landing. Slight difficulty with canopy releases.
4	1170	7-28	Powers 297 110 20000 C-130	37.2 39.7 738 180	170 177 25 17	Satisfactory drogue deployment - very slow rotation to the right. Satisfactory drogue release, firm main deploy kit release and landing. Emergency oxygen ran out at 2000'.
5	1171	7-31	Casto 276 110 25000 C-130	65.2 67.7 799 180	163 174 25 17	Satisfactory drogue deployment - very slow rotation to the right to 18,000'. Between 18,000' & 16,000' rotation increased and became difficult to stop. Satisfactory drogue release, main deploy, kit release and landing. Emergency oxygen ran out at 4300'.
6	1172	7-31	Cherry 309 110 25000 C-130	65.2 67.7 748 194	168 180 26 16	Drogue entangled with legs momentarily on deployment, mid drogue rotation. Satisfactory drogue release, main deploy, kit release. Landing was hard. Emergency oxygen ran out at 5500'.

LIVE JUMPS

TEST CONDITIONS		TIME-SECONDS		RATE OF DESCENT	RATE OF DESCENT	RESULTS		REMARKS									
TEST NUMBER	DROP NUMBER	SUBJECT	GROSS WEIGHT	SPEED KIAS	ALTITUDE	AIRCRAFT	DROGUE RELEASE	MAIN OPEN	IMPACT	MAX.	MIN.	Avg.	MAX.	MIN.	Avg.	LAST 200 FT.	
7	1321	8-14	Casto	276	65	6600	H-21	NA	NA	NA	NA	NA	NA	NA	NA	Satisfactory main canopy performance and operation of suit flotation vest. Satisfactory kit release. Live raft actuation cord broke, failing to inflate raft. See jump report.	
																Jump configuration: Full pressure suit, 45-lb. survival kit with life raft, 24' reserve parachute, 54-lb. test parachute - main canopy deployed by manual ripcord pull on exit from helicopter. Kit released approximately 1000'.	
	1361	8-5	Powers	270	110	35000	C-130	115 113	885 225	170	184	35 15	19.8	20	Satisfactory drogue deployment - very slow rotation to the right. Satisfactory drogue release with mild main deploy Satisfactory kit release and normal landing	Jump configuration: Flying suit, boots, 45-lb. survival kit, 54-lb. multi-stage test parachute, 19-11. 28' reserve parachute, mask & regulator assembly used with emergency oxygen in pack. Manually pulled arming knob on exit. Kit released at approximately 1000'. Emergency oxygen actuated 2 minutes prior to exit.	
	1362	8-21	Casto	276	110	35000	C-130									Satisfactory drogue deployment, rotation to the right during descent. Satisfactory drogue release, main deploy, kit release and easy landing. Emergency oxygen ran out at 8000'.	Jump configuration: Full pressure suit, 45-lb. survival kit with battery for face heat, 19-lb. 28' reserve parachute, 54-lb. test parachute. Manually pulled arming knob on exit kit released at approximately 1000'. Emergency oxygen actuated 2 1/2 minutes prior to exit.

EJECTIONS

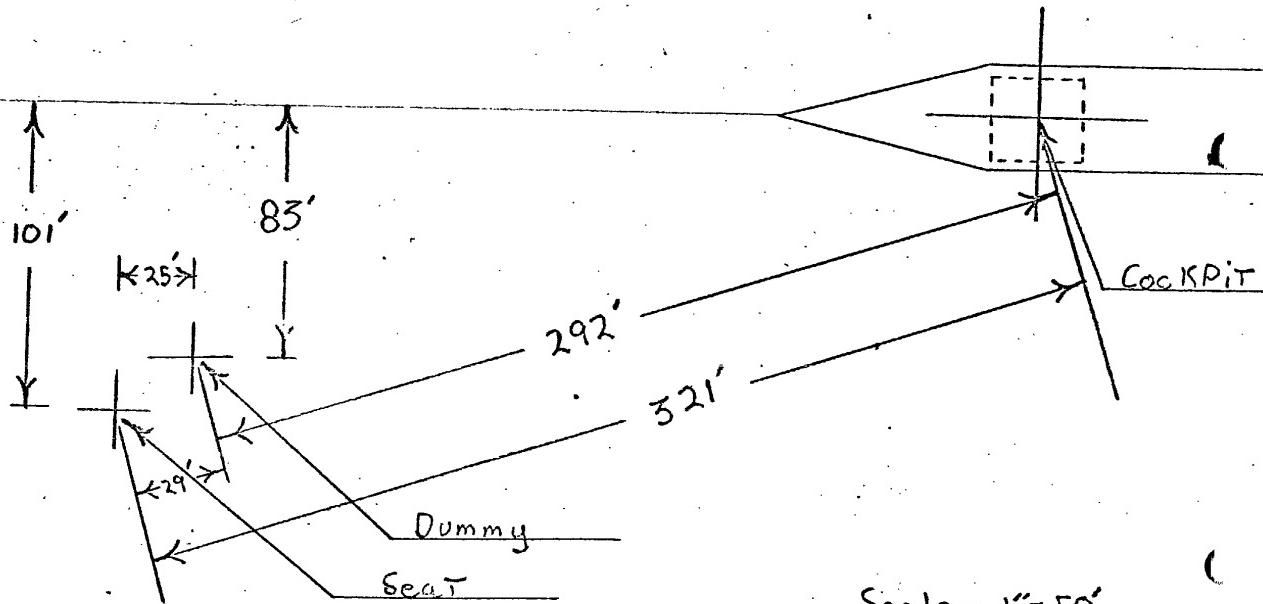
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TEST NUMBER	TEST CONDITIONS		RESULTS														REMARKS									
	DROP NUMBER	DATE	SPEED KM/H	ALTITUDE (1000 feet)	Time In Seconds		Force Data (Pounds)		Accelerometer Data (G's)		Rate Gyro °/Sec.		R/D FPS													
					TO MAN SEAT SEPARATION	PARACHUTE OPERATION	ROCKET BURN OUT (SECONDS)	MAXIMUM HEIGHT (feet)	DOWN FEEL DISTANCE TO IMPACT (feet)	RIGHT RISER FORCE	LEFT RISER FORCE	PEAK RISER FORCE-BOTH	VERTICAL	FORWARD & AFT	LEFT TO RIGHT	VERTICAL (ROLL)	FORWARD & AFT (PITCH)	LEFT TO RIGHT (YAW)	SUIT PRESSURE " H ₂ O	AVERAGE DROGUE	AVERAGE MAIN	CANOPY DAMAGE	RECOVERY			
1	11987/64	0	0	445	NA	NA	NA	Good	OK	NA	300	292	NA	NA	NA	NA	NA	NA	NA	NA	None	Yes	NOTE: All ejections made from rear seat F106 SUCCESSFUL STATIC EJECTION All components operated satisfactorily - Refer to schematic. No telemetry. Accelerometer or rate gyro instrumentation used. Dummy equipped with mask and helmet assembly and survival kit.			
2	13007/30/4	0	0	446	1.4	-	9.7	Good	OK	.7	419	375	NA	NA	NA	18	NA	NA	NA	NA	NA	-	-	No	UNSUCCESSFUL STATIC EJECTION - Dummy tumbled due to seat instability. Main canopy caught on leg of dummy. Main canopy inflation probable if not hindered by leg of dummy. Refer to schematic. Dummy equipped as above. Vertical accelerometer only instrumentation used.	
3	13778/64	0	0	449	1.29	-	9.9	Good	OK	69	299	257	NA	NA	NA	16	NA	NA	NA	NA	NA	-	-	No	UNSUCCESSFUL STATIC EJECTION - Main canopy did not fully deploy because of lack of sufficient speed/pull force. Pilot chute ineffective for 2.0 sec. when entangled with arm of dummy. Deployment doubtful even if entanglement had not occurred. Refer to schematic. Dummy equipped as above. Instrumentation as above.	
4	13468/12/4			427	-	186*	NA	Good	OK	-	-	NA	19 ^{1/2} 0500 ^{**}	19 ^{1/2} 0 ^{**}	10.2	23.5	21	NA	750	800	51.5	- 21.5	Light	Yes	SUCCESSFUL INFILIGHT EJECTION All components appeared to have functioned satisfactorily. Telemetry instrumentation malfunctioned at launch. Resumed normal transmission after 3 seconds. Dummy equipped with full pressure suit and seat kit. Riser forces noted are for drogue risers. ** Values may not be maximum because of T.M. failure * Stop watch time	
5	14618/1964			450	1.6	3.1	675.6	Good	OK	-	-	NA	2050 ⁺ 1850 ⁺	3250 ⁺	20.0	11.4	15.0	60	45	89	NA	NA	-	Light	Yes	SUCCESSFUL INFILIGHT EJECTION Collision of seat and suspension line caused 5 lines to be severed. Main canopy satisfactorily recovered dummy. Telemetry instrumentation failed because antenna was cut during deployment before full open main. Dummy equipped with mask and helmet assembly and survival kit. Riser forces noted are for main risers. + Values may not be maximum because of T. M. failure.

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1st
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22, July, 1964



Scale - 1" = 50'

Estimated Dummy Height
(From Movies) = 300 FT.

2nd Static Ejection Seat Test

30, July, 1964

Scale - 1" = 50'

Estimated Dummy Height
(From Hutch) = 419 ft.

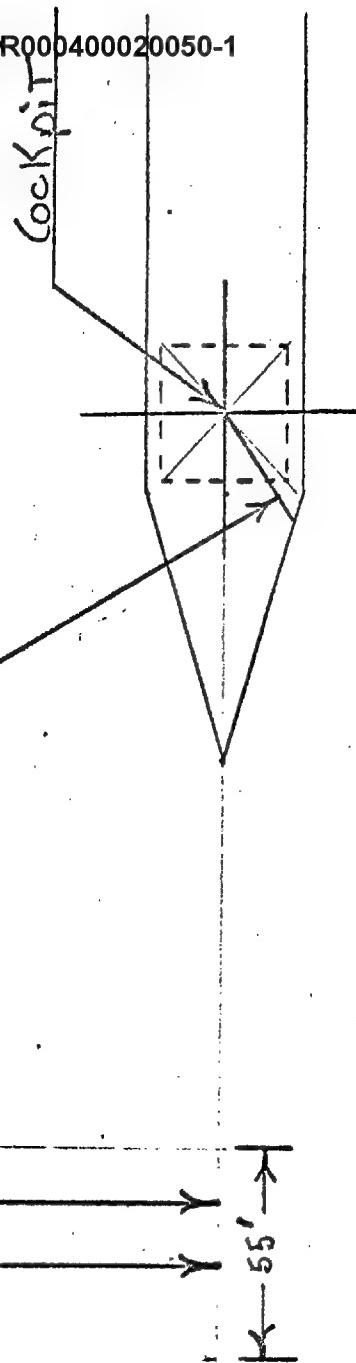
375'

322'

300'

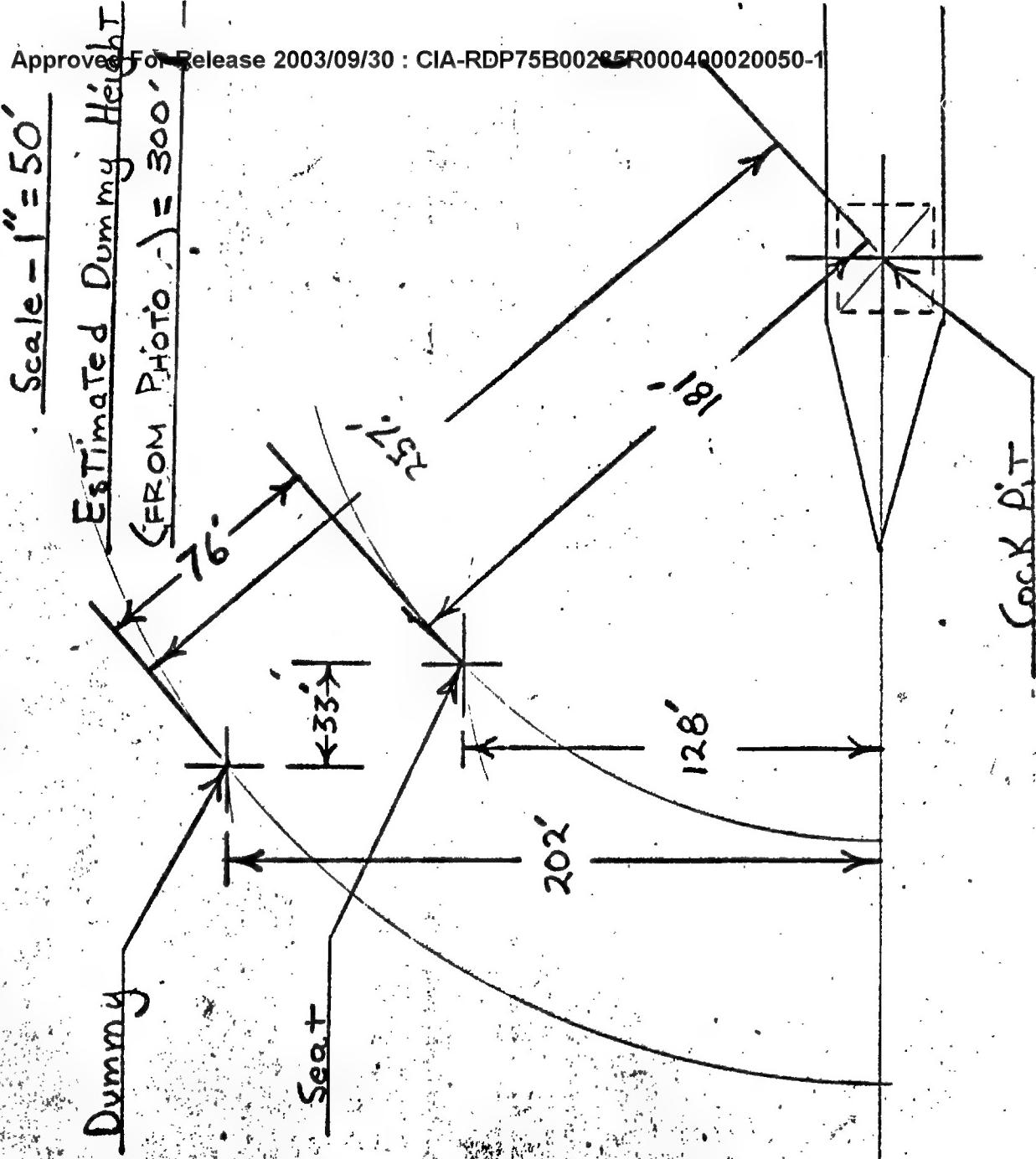
Dummy

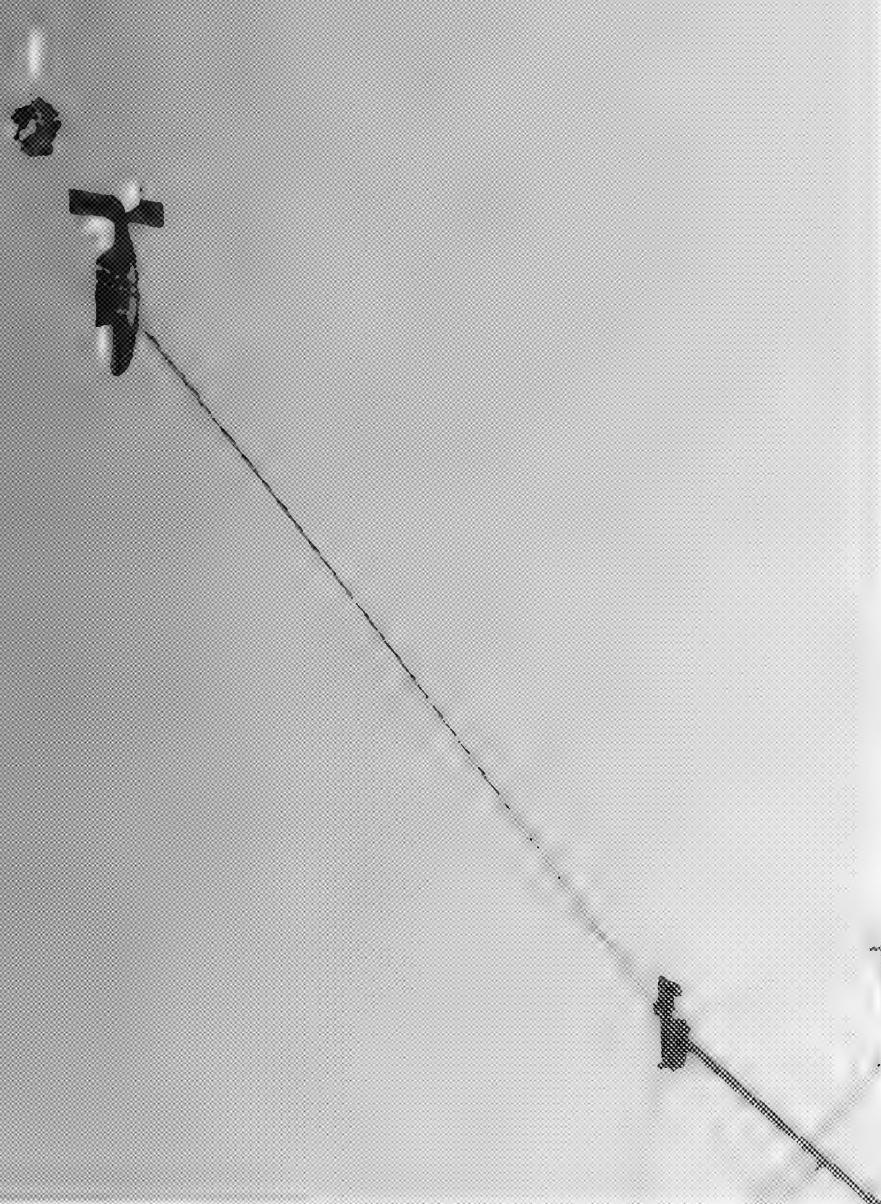
Seat



3rd Static Ejection Seat Test

6, Aug, 1964





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NIG. NO: LAP- 6 6 4 3 (L)-4-62 DATE: 4-4-62
SUBJ:

FTL-232 MULTISTAGE PARACHUTE,
DRW TST US49F62 MERITOLER T ST AT 270
KNOTS, 2.25 FABRIC.

SUPERIOR STILL G/A, 30 FPS. (70MM, FRAMES
1 THRU 20).

FRAME NO. _____

CODE: A/PW
U. S. NAVAL PARACHUTE FACILITY
EL CENTRO, CALIFORNIA

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NEG. NO: 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12
SUBJ: D₁, T_{1,2}, 4, 4-62

FNU-232 was submitted MULTISTAG. TESTS.
DODOR TEST 0549R68 WILTONER TST AT 270
KNOTS, 2,25 FABRIC.
REFERENCE STILL G/A, 30 FTS. (7014M, FRAMES
4 THRU 120)

FRAME NO.

U. S. NAVY PARACHUTE FACTORY
EL CENTRO, CALIFORNIA



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NEG. NO.: LAP- 6 6 4 3 (L)-4-62 DATE: 4-4-62

SUBJ:

FTL-232 WITH STABILIZING MULTISTAGE PARACHUTE,
DROPPED TEST #549F62. MELBOURNE ST. AT 270
KNOTS, 2.25 FABRIC.
SIR, PLEASE STILL G/A, 30 FEET. (70MM. FRAMES
#2 TERO #20).

FRAME NO. 2 CODE: ✓PLW

U. S. NAVAL PARACHUTE FACILITY
EL CENTRO, CALIFORNIA



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NET NO: LAP-6643 (S) -4-62
SUBJ: DIA TEE: 4-62

FTL-232 FOR MILITARY MULTIST.G. FA. ACCHUTE
DRAFT TEST U549F62 WIRLDRUM T ST AT 270
KNOTS. 2-25 8-BITS

SUPER-8MM STILL G/A, 30 FPS. (7044, FRAMES 1-20)

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NTG NO: LAP- 6 6 4 3 (L)-4-62 DATE: 4-4-62

SUBJ: FTI-232 OR CONTINENTAL MULTISTAGE PARACHUTE

DROP TEST 054976A MURDOCH TEST AT 270

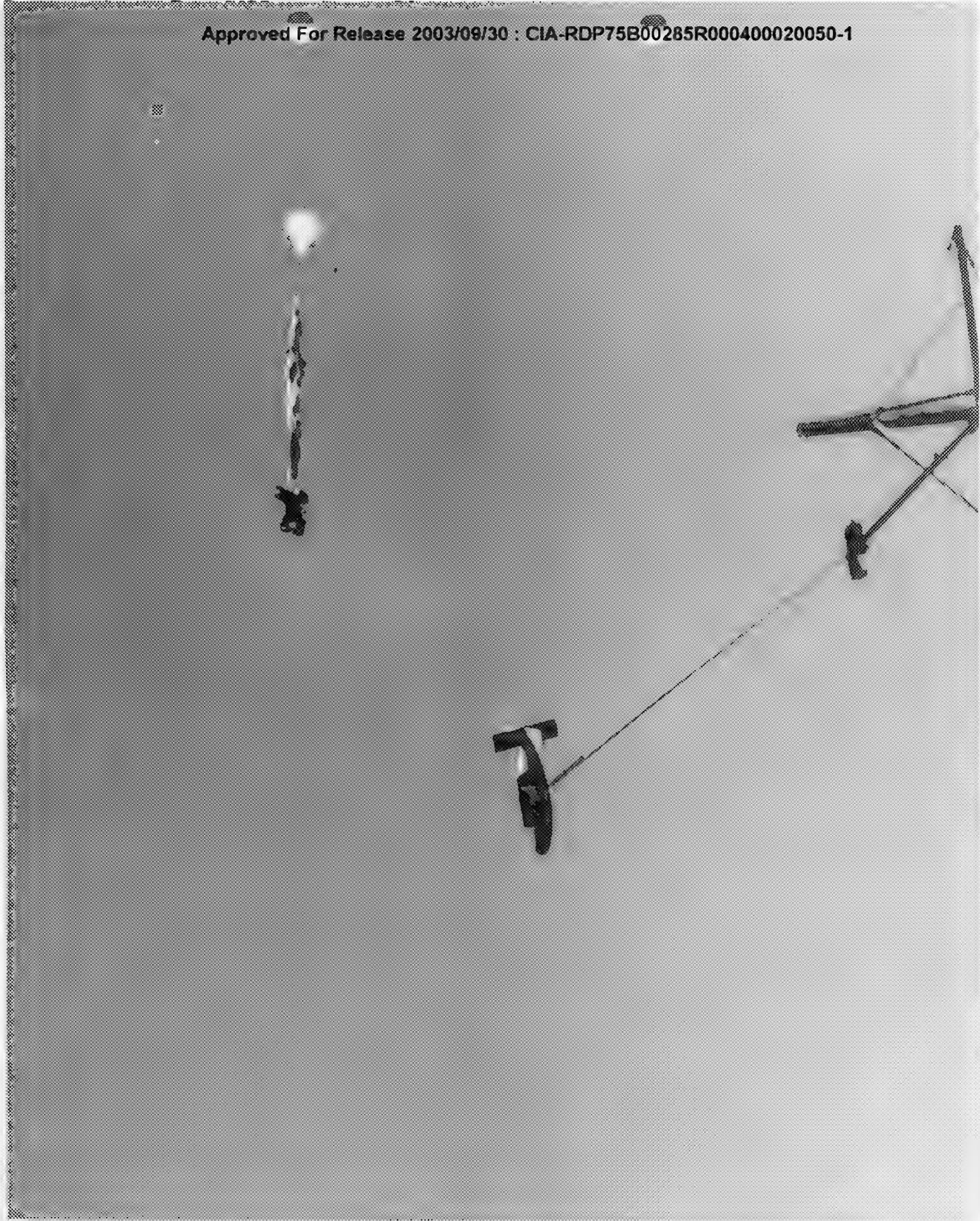
KNOTS, 2.25 FABRIC.

SUPPLY STILL G/A, 30 YES. (7046, FRAMES

#1 THRU #20)

FRAME NO. _____ CODE: A/P12

U. S. NAVAL PARACHUTE FACILITY
EL CENTRO, CALIFORNIA



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REG. NO: LAP- 6 6 4 3 (L)-4-62

DATE: 4-4-62

SUBJ:

FTI-232 - 100' MIA MULTISTRG. PARACHUTE,
DROPS TST N549F68 WINDOMER TST LT 270
KNOTS, 2.25, RABRIC.

S. U. NC. STILL G/A, 30 FRS. (70MM. FRAMES
1 THRU #20)

FRAME NO.

00285 RIO

U. S. NAVAL PARACHUTE FACILITY

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NEG. NO: LAP- 6 6 4 3 (L)-4-62 DATE: 4-4-62
SUBJ:

FTI-232, VENTRAL WING, FAIRCHILD PARACHUTE,
DROP TEST 154 WF68, MIRITONER T ST AT 270
KNOTS, 25% FABRIC.
SIX UNCL. STILL G/A, 30 FTS. (70 FT. FRAMES.
2 THRU 20)

FRAME NO.

6

CODE: A/PAC
U. S. NAVAL PARACHUTE FACILITY
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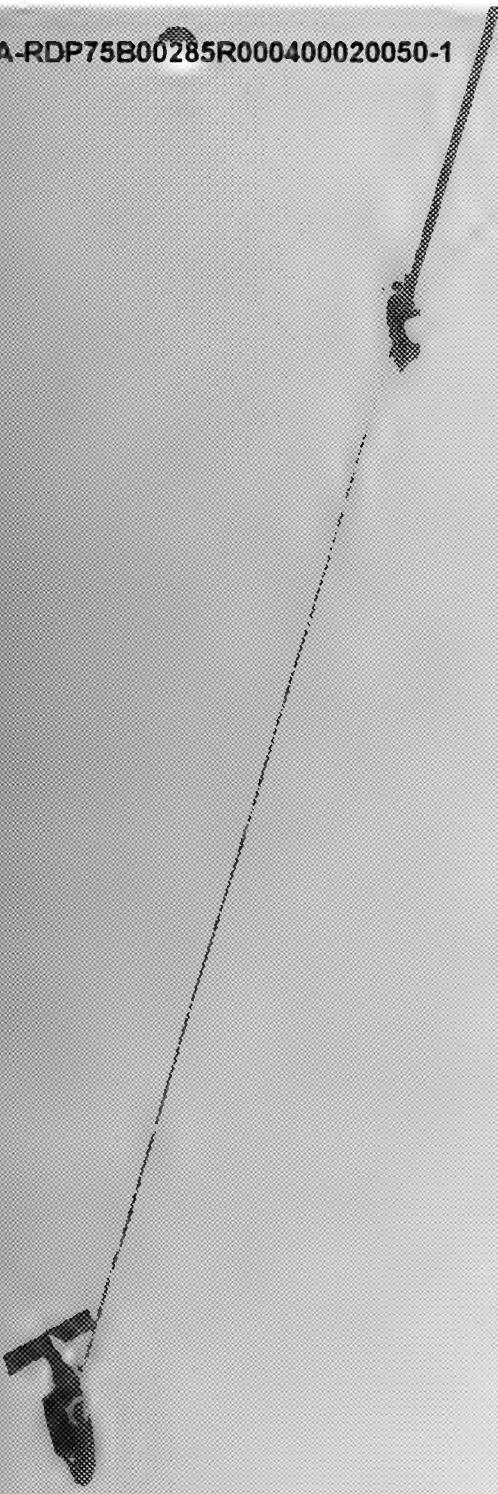
NEG#NO: LAP- 6 6 4 3 (L)-4-62 DATE: 4-4-62
SUBJ:

FNL-232 MULTISTAGE PARACHUTE,
DROP TEST 3549 FT.
KNOTS, 2.25 FABRIC.
SEQUENCE STILL Q/H, 30 FEET. (70MM, FRAMES
#1 THRU #20)

FRAME NO.

COL: 74/PIC
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NIC NO: 143-6643 (L)-4-62 DATE: 4-4-62

FILE #232 AIR STATIONNAIR MULTISTAGE PA. PARACHUTE,
DESP. TEST U549F68 MIRRORED T-ST AT-270
DURATION: 2.25 SECONDS
EQUIPMENT: 2025 FABRIC
CAMERA: STILL G/A, 30 FPS. (70MM, FRAMES
#20)

FRAMES:

10. CODE: 14/PAC
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NEG#NO: LAP- 6 8 & 3 (L) 4-62 DATE: 4-4-62
SUBJ:

FTL-232 OR MILENTAL MULTISTAGE PARACHUTE,
DROP TEST U549F68, HIRTOER TST AT 270
KNOTS, 2625 FEET.
SINCE STILL G/A, 30 FES. (70%₂) FRANC'S.

7
12 THRU 20)

FRAME NO. 7

COOL: N/PIC
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NEG. NO.: LAP-6643 (i)-4-62 DATE: 4-4-62

SUBJ:

FTL-232 AND STURMAG MULTISTAGE PARACHUTE,
DROP TEST U549R68. MIRRORED TEST 270
KNOTS, 2025 FABRIC.
SUSPENCE STILL G/A, 30 FEET. (70% OF RIMLS
AT TERU #20)

FRAME NO. 16 DATE: APR
U. S. NAVAL PARACHUTE FACILITY
FLORIDA

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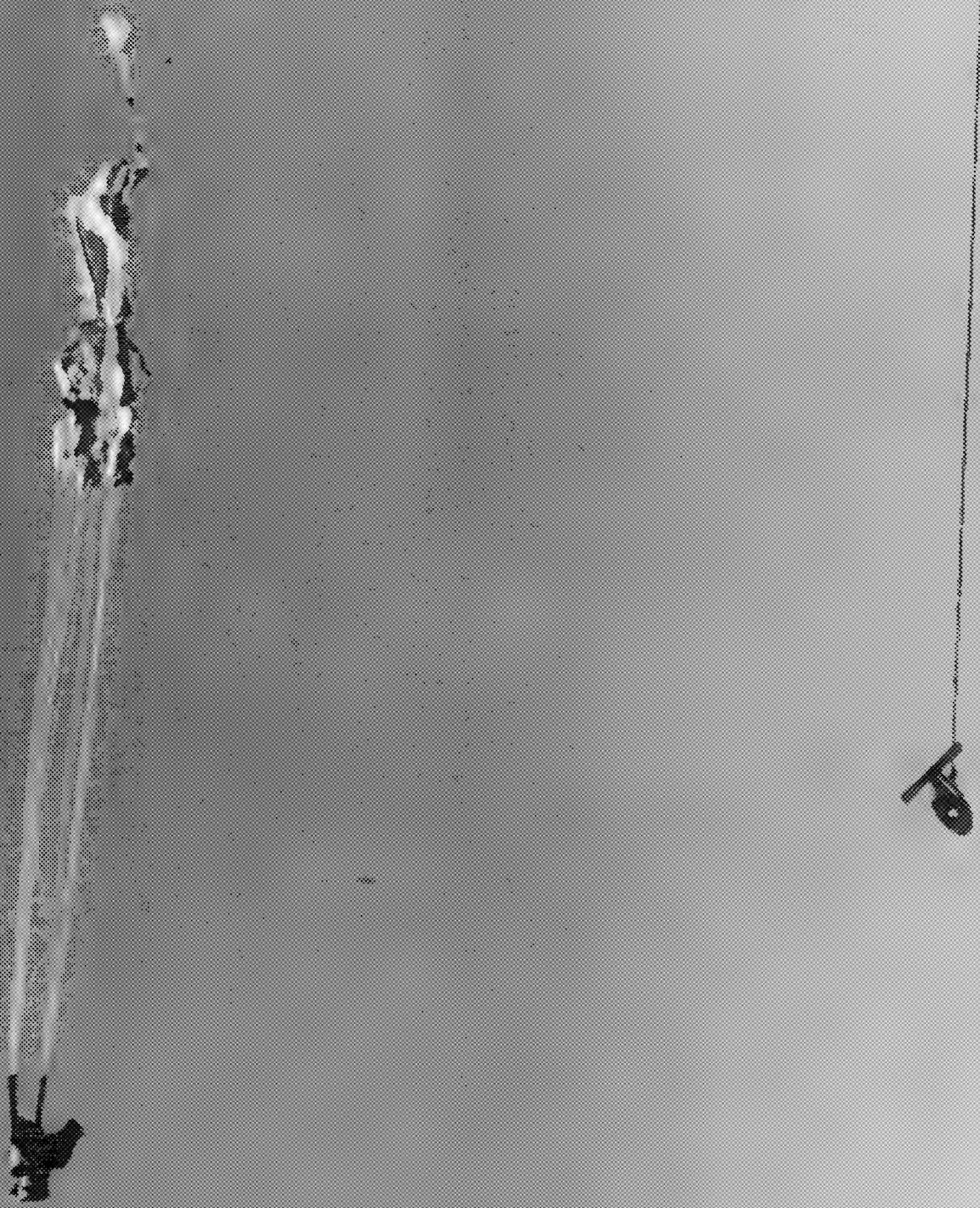
LOG NO: LAP- 6643 (5)-4-62 DATE: 4-4-62
SUBJ:

FTL-232 (U.S. MOUNTED PARACHUTE, PK. ACCHUTE,
DROP TEST, USA, RF65, AIRBORNE TEST AT 270
KNOTS, 2.25 FABRIC.
SILENCE, STILL & A, 30. PES. (NOV., FRAMES
#1 THRU #20)

FRAME NO. 11

100% /PLW
U. S. NAVAL PARACHUTE FACILITY
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P. NO: LAP- 6 6 4 3 (4)4-62 DATE: 4-4-62

SERIAL:

FTL-232 ~~U.S. NAVAL MULTISTAGE PARACHUTE~~,
DUE TEST 349768. INFLATOR TUBE AT 270
KNOTS, 2.25 FABRIC.

SUSPENSION STRUT G/A, 30 FEET. (70MM FRAMES
IN FRAME #20)

FRAME NO.

COLLEGE OF MILITARY

U. S. NAVY PARACHUTE FACILITY
EL CANTO, CALIFORNIA

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NTG. NO: LAP- 6 6 4 3 (u)-4-62
SUBJ: DATE: 4-4-62
FTL-232 (u) MOUNTAIN MULTISTAGE, PARACHUTE,
DIVE TEST U24,9F68 MIRAMONTE TEST 2A
KANTS, 2,25 FABRIC.
S. U. NCE STILL G/A, 30 FPS. (70MM, FRAMES
TIL THRU 20)

NAME: John ³ Plu
NAME: U.S. NAVAL PARACHUTE FACILITY
U.S. NAVAL PARACHUTE FACILITY
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NEG. NO: LAP- 6 6 4 3 (L) 4-62 DATE: 4-4-62

SUBJ:

FIL-232 air mail. MULTISTAGE PARACHUTE,
DROP TEST U549F68. HIRANGER TST AT 240
KNOTS, 2-25 FABRIC.
Si. MINGE STULL G/A, 30 PES. (TOMI, FRAMES
IN TBRU #20)

FRAME NO.

COM: JPN
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NEG. NO.: LAP-6 6 4 3. (4)-4-62 DATE: 4-4-62

SUBJ:

FTL-232 (ALL INFORMATION CONTAINED
HEREIN IS UNCLASSIFIED)
DRW TEST - U549F68 HARMONIC TEST AT 270
KNOTS, 2.25 FIBRIC.
SUJNCE STILL G/A, 30 FRS. (704), FRAMES
#1 THRU #20)

FRAME NO. 15 DATE: APR 1962

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DATE: 4-4-62

NET NO: LAP-6 8 4 3 (4)-4-62

SUBJ:

FIL 232 ~~WIRING~~ MULSTING, FA. ACHUT,
DRAK TEST. 4549F68 WIRLDRER T ST 270
KNOTS. 2.25 FABRIC.
SILENCE STILL G/A, 30 FRS. (70M, FRMKS
WIRU 720)

FRAG. NO: 160
CODE: VPL

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DATE: 4-4-62

NEG. NO: LAP 6 6 4 3 (L) 4-62

SUBJ: FTI 232 NVAL PARACHUTING, FA. CHUTE,
DIVE TEST US49768 HIRADOWER TST, T 270

KMITS, 2025 FABRIC.
SINCE STILL G/A, 30 FRS. (NO. OF FRAMES)

SHOT NUMBER 17

FRAME NO. 1000: 17 PLATE
FAVLE NO. 1000: 17 PLATE
FAVLE NO. 1000: 17 PLATE

U. S. NAVAL PARACHUTING FACILITY
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NEG. NO: LAP- 6 6 4 3 (L)-4-62 DATE: 4-4-62

SUBJ:

FTL-232 AIR ALLIMENTAL MULTISTAGE PARACHUTE,
DROP TEST 454.9F62 MIRROTOWER T-ST AT 270
KNOTS, 2.25 FABRIC.
SEQUENCE STILL G/A, 30 FRS. (70MM, FRAMES
#1 THRU #20)

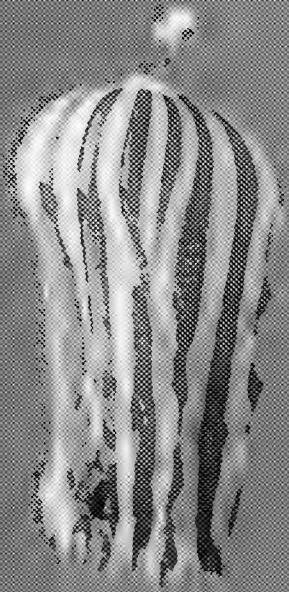
FRAME NO:

CODE: A/PLO

U. S. NAVAL PARACHUTE FACILITY
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18

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NEG. NO: LAP- 6 6 4 3 (L)-4-62 DATE: 4-4-62

SUBJ:

FTI-232 MULTISTAGE PARACHUTE,
DROP TEST U549F68 WHIRLWIND TST AT 270
KNOTS, 2.25 FABRIC.
SEQUENCE STILL Q/A, 30 PBS. (70MM, FRAMES
#1 THRU #20)

FRAMES NO. 18
CODE: A/P20
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U. S. NAVY PARACHUTE FACILITY
TO CHINQ, CALIFORNIA
PAGE NO. 19 OF 20
S/N 11000 STS G/A, 30 PGS. (70AM, PRAGS
NOTS, 2/45 PABTG).
DROP TEST NO 34968 MILETOWER TST AT 270
FTL-232 U. S. MILITARY MULTISTAGE FA-ACTION,
SUBJ: DATE: 4-4-62
REF ID: AAF-6643 (L)-4-62
UNLESS OTHERWISE SPECIFIED
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U. S. NAVY PARACHUTE

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FIG. NO: LAP- 6 6 4 3 (L)-4-62 DATE: 4-4-62

SUBJ:

FTL-232 w/ ALLNTAL MULTISTAGE PA CHUTL,
DROP TEST U549P62 MIRLTONER T-ST AT 270
KNOTS, 2.25 FABRIC.
SEQUENCE STILL G/A, 30 FTS. (70MM, FRAMES
#1 THRU #20)

FRAME NO: 20 CODE: N/PLU
U. S. NAVAL PARACHUTE FACILITY
EL CENTRO, CALIFORNIA

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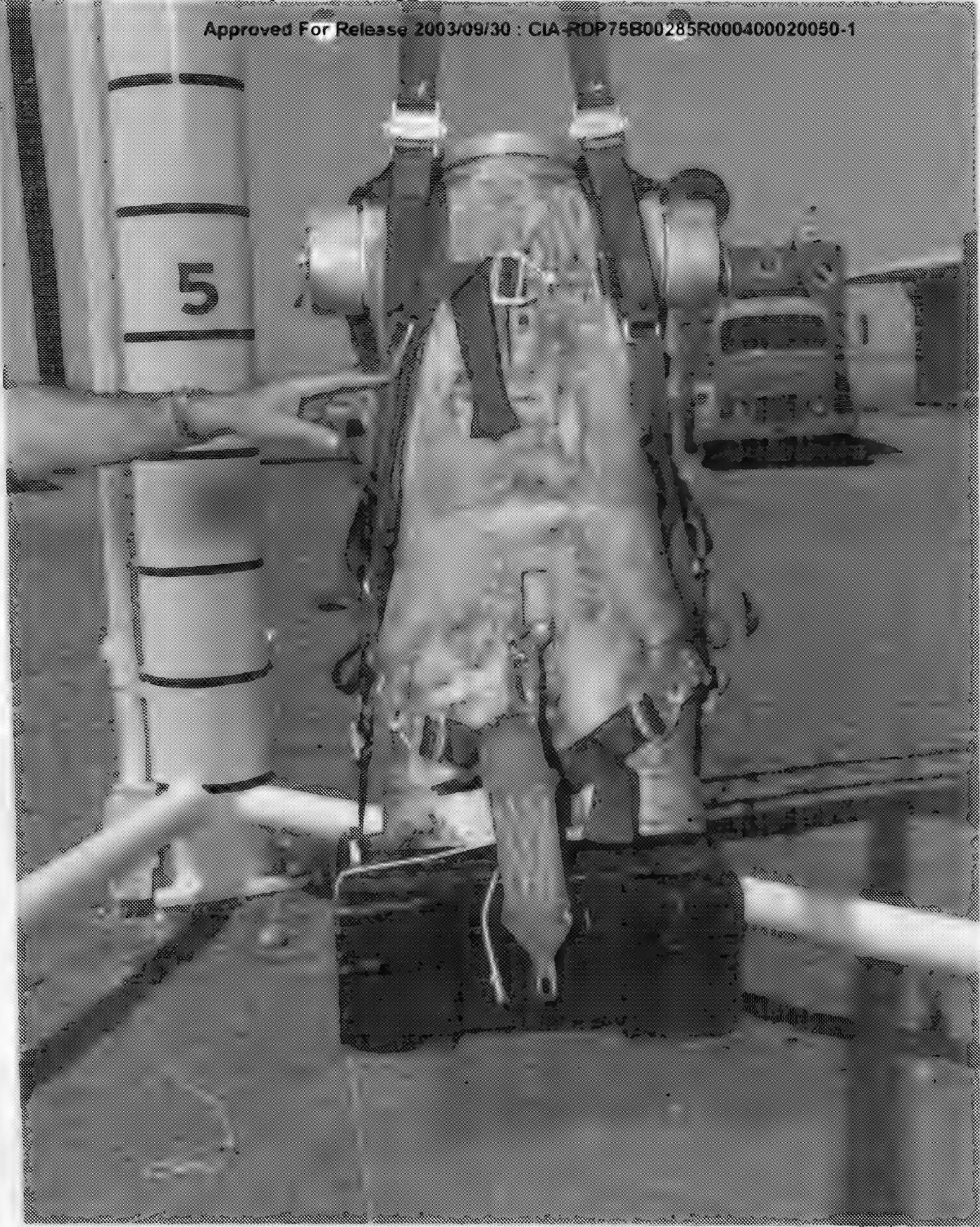
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NICeNU: LAP- 6 6 4 3 (L)-4-62 DATE: 4-4-62
SUBJ:

FTI - 2 m. VERTICAL MULTISTAGE PA. PARACHUTE,
DRA. TEST 0549F62 WHIRLWIND T ST AT 270
KNOTS, 1,15 FABRIC.

S. U NC STIL G/A, 30 FPS. (70MM FRAMES
12 SEC. 2)

FILE NO. 17 CODE: A/P10
U. S. NAVAL PARACHUTE FACILITY
PT. LORRO, CALIFORNIA



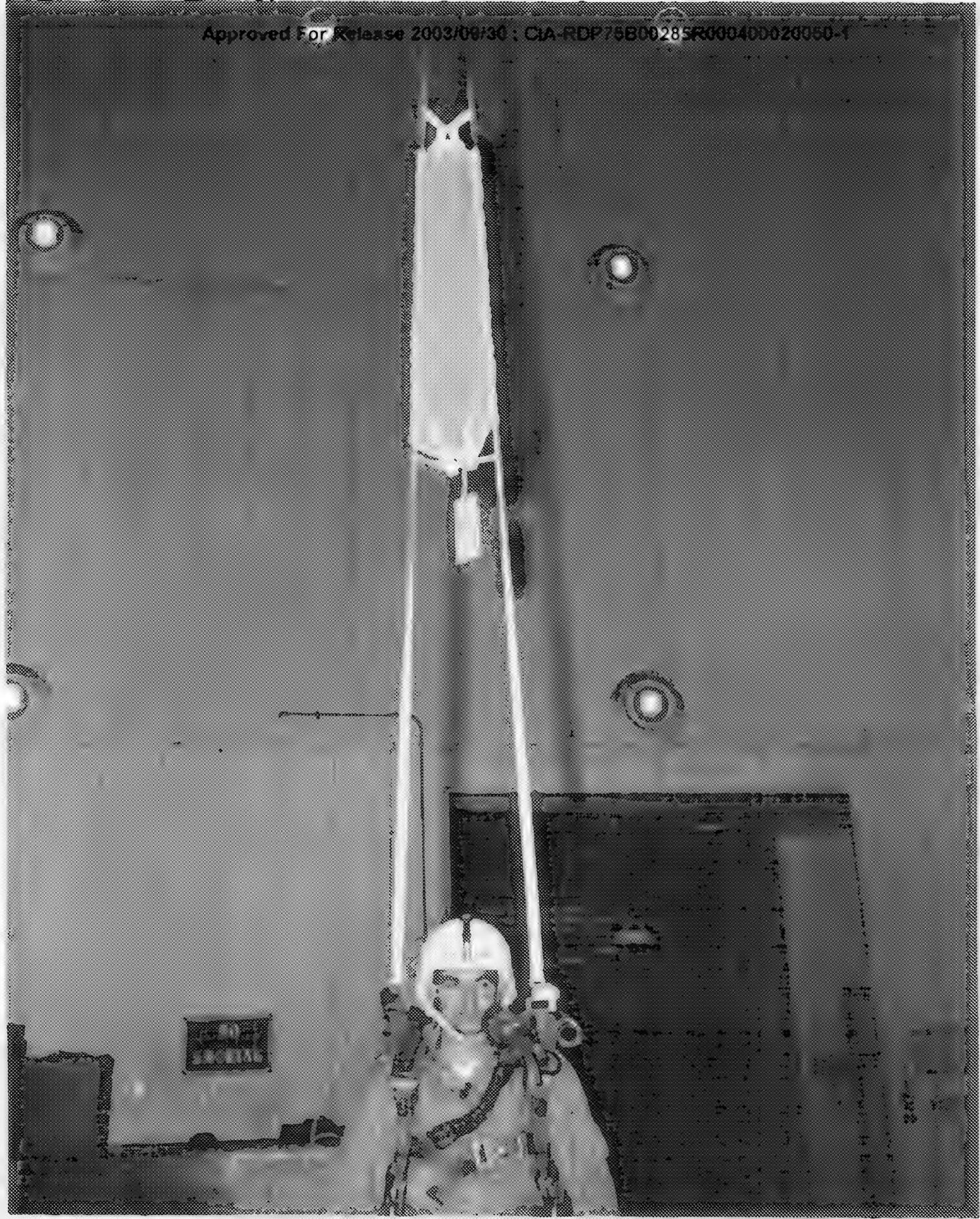
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NEG. NO: LAP- 7925 (L)-7-62 DATE: 7-25-62

SUBJ: FTL-232 EXPERIMENTAL PERSONNEL PA-
RACHUTE (MULTISTAGE), - HARNESS
STRENGTH TESTS.

HARNESS, SHOWING RESULT OF 12,200
LB FORCE APPLIED AT DROP TOWER
TEST #1373F62.

CODE: A/P2
U. S. NAVAL PARACHUTE FACILITY
EL CENTRO, CALIFORNIA



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REF ID: ~~MAP-~~ 6419 (L)-2-620476; 2-8-62
SUBJ: FTL-232 ELEMENTAL MULTISTAGE PER-
SONNEL PARACHUTE ASSEMBLY SUSPENSION
TEST

CODE: A/P
U. S. NAVAL PARACHUTE FACILITY
EL CENTRO, CALIFORNIA



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BY THE ORDER OF THE
CHIEF OF NAVAL OPERATIONS

NNU,NOF LAP- 1641(L)-4-58 DATE: 4-7-58
SUB I: PTL-56A MULTI-STAGE PARACHUTE MODEL 1-7
DROP SEQUENCE BOARD. COMPOSITE

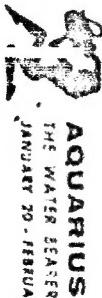
CODE: CII
NAVJL PARACHUTE UNIT
NAS, EL CIDRO, CANAR.



CAPRICORN
THE GOAT

JANUARY

Approved For Release 2003/09/30 : CIA-RDP75B00285R000400020050-1



AQUARIUS
THE WATER BEARER
JANUARY 20 - FEBRUARY 18

FEBRUARY

Approved For Release 2003/09/30 : CIA-RDP75B00285R000400020050-1

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